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Figure 3. Annotated sequence of the paralogue cluster

```
        |   10     |   20     |   30     |   40     |   50     |   60     |   70     |   80
  1 ccatgggagc agcatcgcag tgcgcctccc cggccgccat  gccgctagct ggtagtcccc ctgccgggtg ccgaccgccg 80
                                  ← stop sensor kinase
 81 gggcggtccc gggtgcggcg gccggatcta gtcggtgtgc  tccgacggtg cctgctgggt gaggggcagt gtcaggcgga 160
161 tggtggttcc cgcgccgggc gggctgtgca gccgcagttg  gccgccgagt gcctccaccc ggtcggtgag gccgacgagg 240
241 cccgagcccc ggcagggggc ggcgccaccg cggccgtcgt  cgcggatgcc gacgtggagc cgtccgtccc gggtggccac 320
321 atggacgtcg acgacggtgg caccggagtg cttggcggcg  ttggtcaggg cctcggagac ggcgtagtac gcggcggtct 400
401 cgaccggttc ggggtggcgt tccccggtct ggatgtcgag  ccggaccggg atggcggagc gccgggccag ggccttgagc 480
481 gccgggcgga gtccgccctc ggcgagtacc gccgggtgga  tgccccgggc gacctcccgg agttcgtcga cggcggcggc 560
561 cagcccgtcg gtcacctcgt cgagctgccg gatcagctcg  tcggcgtcga gcggcaccga cagttgcacg gtgcgcaccc 640
641 gcagcgccag ggagaccagg cgctgttggg ggccgtcgtg  caggtcgcgt tcgatacggc ggcgggcggt gtcggcggcg 720
721 gcgacgatcc gggcccgtga cgcggtgagg gccgcctgcg  tctccgcgtt ggcgatggcg gtggccacca gttcggtgaa 800
801 gccggccagc cggtcctcgg tgtccgacgg catcggcttg  tcgttcatcg acgccacgct gagcgcgccc cacagttgtc 880
881 cgtcgacgtt gatcggcatg cacaccgtgg cgcggaatcc  ccactccttg ccgacgacgg aggccgggcc cgaggacacg 960
961 gccgcgtagt cgtcgatccg cgccgggcag cccgactcga  acaccagggt gtgcacattc cggccgccgg gcggtacctg 1040
1041 gataccggcg ggaaaatcac ggccggtcct ggtccaggcg  gcgacataca gggcggttcc gttgggctcg taacggccga 1120
1121 ggaccgcgaa gtcggccgag aggagctgtc cggcctcggc  ggcgaccgcg gcgaacacct ccttcggcgg tgccgcccgc 1200
1201 gcgaccaggg tcgccacgcg ccgcagcgcc gcctgctcct  cggcggcccc ccgcagctcc acacgtgcct gggtgttcgc 1280
```

Figure 3a/3

REPLACEMENT SHEET SUBMITTED ON SEPTEMBER 4, 2009

Figure 3 Continued

```
1281 gatggcggtg gccacgaggt cggtgaaacc ggccagccgg  tcctcggtgt cgggcggcag cggttccgcg gtcagcgaga 1360

1361 tcgccatcat cacgccccac agccgtccct cgacgttgat  cggcacgccg acgaccgaac cGAAGCCGCG CGCCCTGGCG 1440

1441 AAGTCGGCGG GTGCCCCGGA CGACTCGGCG GCGTCGTCGA  TCCGGGCCGG CCGCCCCGTC TCGGACACCA GCGTCACCAC 1520

1521 GTTCCGGCCG TCGGGGTCCA CCCGGGTGCC GATGGGGAAG  AGCGGGCCGT GCAGACTTCT GGACCAGCCG CCGACGGCGC 1600

1601 TCGCCATGCC GTCCGGATCG AGCCTGATGA TTCCGGTCAC  ATCGTTGCCG AGCAGTTCTC CGACTTCGGC GGCGACCGTC 1680
                                                                                    start
1681 GCGAACATCT GTTCCGGTGG GGTGGCCCTG GCCACCAGGG  TCGCCACCCG TCGGAGTGCC GCCCGCTCCT CGACGATCTG 1760
sensor kinase ←
1761 TTCGCACGAC ACGACCGCTG CCAGGCCCCC CTACCCGCCC  GATGACGCCC GCATACCGGG TATCACGGCA CATCAGCATG 1840

1841 ACGTCCGCCG TGAACGCCCG TCAACGTGGC CCGCCGGAGT  CGGGAACACG CGTCCGGAAT CAGCCCCCGG AACGGCGGGA 1920

1921 CCGTCTTCCT CCGTCCGGCG CGGGGCACTG CGCCGCGGCG  GAATCCGCCC TGACCTCGGG AGTTTGCAGC TAGCTGGAAT 2000

2001 CAGCGGTTCG GGTTGGTGGG AAGGGATGTT GGCCGCTGGC  GGCGATGCGG AAGCCGATCG TTCCCAGTAC TTCTGGGAAG 2080

2081 TGCGTCGCGG AGAGTCGGTC CGCTTCCCCG AGTGGGCCGC  GACGACGCTG CGGGTTCTCC ACGGGGGAGA GATCCGCGAA 2160

2161 CCGGCGAAGG AGCTGCCGTG TCGGACGTCT TCGCATCCGA  GAAGAGTTCG CCCGGTGTCC GGACCCGCGC GGCAACGTCC 2240
                                                                          → start of cvm7par
2241 CCACCGCGCT CTGTCATCAG CGCCGTCGGC GCCGTCAGCC  ACGCAGAGAA GATCGGATAC GCAGTGTACG AGTGCAGCGA 2320

2321 TGAGGTTCGT CACGACGTCC CCGGCCTGCC GGGTCCGTCA  CCGTCCATCA CCGTCCTGGG CTGTCTGGGC GTACGCGCCG 2400

2401 ACGGCCGGAA ACTGGAGCTG GGCCCTCCGC GTCAGCGGGC  CGTTTTCGCC CTGCTGCTCA TCAACGCGGG CAGTGTGGTG 2480

2481 CCGGTCGACt cgatcgtctt ccgtatctgg ggcaactcac  caccgggcgc ggtcaccgcg acgctccagt cctatgtgtc 2560
```

Figure 3b/3

REPLACEMENT SHEET SUBMITTED ON SEPTEMBER 4, 2009

Figure 3 Continued

```
2561 ccggctgcgg aaactcctgg ccgagtgtgt gctcccggac  ggttcgacac ccgaactgct gcaccagccg ccgggctaca 2640
2641 ccctcgcgct cggcaccgag cacatcgacg cgaaccgttt  tgagcaggcc atcaggacag ggcgccggct ctcgcgcgag 2720
2721 gagcagcacc aggaggcgcg ggccgtgctc tgccaggccc  tgctgagctg gggcgggaca ccgtacgagg agctgagcgc 2800
2801 gtacgacttc gccgtccagg aggccaatcg gctggagcag  ctccggctgg gcgccgtgga gacatgggcg cactgctgtc 2880
2881 tgcggctggg gcgggacgag gaggTGATGG ACCAGCTCAA  GCCGGAGGTG CAGCGCAATC CGCTGCGGGA GCGGCTGATC 2960
2961 GGGCAGCTCA TGCAGGCGCA GTACCGGCTG GGGTGCCAGG  CGGACGCGCT CAGGACGTAC GAGGCGACGC GGCGGGCCCT 3040
3041 GGCCGAGGAG CTGGGGACCG ATCCGGGCAA GGAGCTGGCG  GCGCTGCACG CGGCGATCCT GCGTCAGGAC AACGGTCTGG 3120
3121 ACCGCGTCGT CCCGGCGTCC GCGCCGCCGT CGGCGGGGGT  CGGGCGGGGG GCCGTGACGG TGTCGGTCCC GGCACAGCGG 3200
3201 TCGAGGCCGT TGACGCGGCC GGTGGCGGGG CGGGCGCGGG  TCCCGGGGGC GATGACGGTG GCGGCGGGCG CGGGGGCGGC 3280
3281 CCCCGCGTCC GCCTCCGGCT CCGTTTCCGC GTCCGTTTCC  GGCTCCGGCT CCGGCTCCGG CTCCGCTCCT GCGTCGGTTC 3360
3361 CCACCTTCTT TCCCGGCTCC GTTTCTGGCT CGGCGTCCGT  TGCCGCGTCC GTAGCCGCGC CCGTTTCCGG CCATGTCTCC 3440
3441 GGGCCCGGGT CCGCTTTCGG GTCCGTGGCG CTCCACCGGC  CGCAGACCCT CCGGGGCGAG CCGGTCCACG GGGGCGCGCA 3520
3521 GGGGATGCGC ACCGGGCAGG TGTTCCCCAC GCTGCCGCCG  TTCGTCGGGC GCGGCGACGA GCTgcgcggt ctgctggagt 3600
3601 ccgcgacgtc cgcgttccac acctcggggc gggtggcgtt  cgtcgtcggc gaggcgggca gcggcaagac ccggctcctc 3680
3681 tccgagttgg agcgctcggt tccggacagt gtgcgcaccg  tctgggcgtc ctgttcggag agtgaggacc ggcccgacta 3760
3761 ctggccgtgg acgaccgtgc tgcggcatct gtacgcgatg  tggccggaac gtatgcacgg attccccggt tggctgcggc 3840
3841 gcgcactcgc ggaactgctt cccgaggtgg gcccggagcc  acaggggccg cactcccccg acgggggcga ggagaacagc 3920
```

Figure 3c/3

REPLACEMENT SHEET SUBMITTED ON SEPTEMBER 4, 2009

Figure 3 Continued

```
3921 ggcaacgggg acggtgcggg cgacggggac agcaccccgg  cgcacaccct cacgctcgcg cccgctctcg cgcccccgcg 4000

4001 ctccagagag gctcgtttca ccctgcacga cgccgtgtgc  caggcgcttc tgcgcacggt ccgcgaaccc gtggtgatca 4080

4081 tgctggagga catggagcgg gccgacgccc cctcgctcgc  cctgctgcgc ctcctggtgg agcaactgcg caccgtcccc 4160

4161 ctgctgctcg tggtcaccac gcgcaccttc cggctcgcgc  acgacgccga gctgcgacgg gccgccgccg tgatcctcca 4240

4241 gtcgaccggc gcgcgccggg tcctgctgaa cgccctggac  gcacgggcca ccggggaact cgccggaggg atgctgggca 4320

4321 aggccccgga caccctcctc gtacgggccc tgcacgagcg  ctccgccggg aacccgtact tcctcgtcca gctcctccgc 4400

4401 tcgctccggc aggggctcgc cgccgcctgg gagacggaga  tcccggacga gctggccggg gtcgtgctgc aacggctgtc 4480

4481 gagcgtgccg cccgccgtgc gccgggtgct cgacatctgc  gcggtcgtgg agcgcagttg cgaacggcgt gtgatcgaga 4560

4561 ccgtgctgcg ccatgaggga atcccgctgg agaacgtccg  tacggcggtc cgcggcggtc tgctggagga agaccccgac 4640

4641 gaccccgggc ggctgaggtt cgtgcatccg ctggtccggg  aggccgtctg ggacgacctg gagaacaccc gtcggcccgt 4720
                                  stop cvm7par ⟶
4721 gtcccgttcc tccgcgctcg gggcgctggc cacggtctga  gtcccgggcc ccggggtcct cgGCGGCGGG CGGCGCTTGC 4800

4801 GCGCTCCCCG ACGCCGGGCT TGATCCCCCG GGGCAGCCGG  ACGCGCAGCC GGGTGCAAGG GGCGGTGCCG ACACTGGGCG 4880

4881 GGCGGCGGCC GTGGCCGGTC GCCGCCCCCC ACGGCCCACC  GAGGAGCCCC CATTGGACAC GTACGCAGCG GATACGTACC 4960

4961 CGCGGTCCGG CACCCACCCC GAGCCGCGTC CCGACGCACC  TCCCCACGCG CGTCCCGGGA CCCGTCCCGG CACCCGTTCC 5040
                                                                  ⟶ start cvm6par
5041 GAGCCGCGCC CGGACCCGGG CGCCGAGGCC GCGTGGCTGC  TCGCGGCGGA CCGCGCCCAT ATGTTCCACC CGGTCCTGCC 5120

5121 CCGGGGCCGC GAGGACCGCA CCGTTCTGGT CTCCGGCCGC  GGCTGCACCG TACGGGACAC CGAAGGGCGC ACCTATCTCG 5200
```

Figure 3d/3

REPLACEMENT SHEET SUBMITTED ON SEPTEMBER 4, 2009

Figure 3 Continued

```
5201 ACGCCTCGTC GGTGCTCGGA CTGACCCAGA TCGGCCATGG  ACGTGAGGAG ATCGCGCAGG CCGCCGCCGA GCAGATGCGG 5280
5281 ACACTCGGTC ACTTCCACAC CTGGGGCACC ATCAGCAACG  ACAAGGCCAT CCGACTGGCC GCGCGCCTCA CCGACCTGGC 5360
5361 GCCCCAGGGT CTCCAGCGCG TCTACTTCAC CAGCGGCGGC  GGCGAGGGCG TCGAGATCGC CCTGCGCATG GCCCGTTACT 5440
5441 TCCACCACCG CACCGGCAGC CCGGAGCGCA CCTGGATCTT  GTCGCGCCGC ACCGCCTACC ACGGCATCGG CTACGGCAGC 5520
5521 GGTACGGTGT CGGGCTCGCC CGCCTACCAG GACGGGTTCG  GCCCGGTGCT GCCCCATGTG CACCACCTCA CGCCGCCCGA 5600
5601 CCCGTACCAC GCCGAGCTGT ACGACGGCGA GGACGTCACG  GAGTACTGCC TGCGCGAACT CGCCCGCACC ATCGACGAGA 5680
5681 TCGGCCCCGG GCGGATCGCC GCGATGATCG GGGAGCCGGT  CATGGGCGCG GGCGGCGCCG TCGTCCCGCC GCCGGACTAC 5760
5761 TGGCCGCGCG TCGCCGCGCT GCTGCGCTCC CACGGCATCC  TGCTGATCCT GGACGAGGTC GTCACCGCGT TCGGCCGCAC 5840
5841 GGGGACCTGG TTCGCGGCCG AGCACTTCGG GGTGACCCCC  GATCTGCTGG TGACCGCGAA GGGCATCACC TCCGGGTATG 5920
5921 TCCCGCACGG GGCGGTGCTC CTGACCGAGG AGGTCGCGGA  CGCCGTGAAC GGGGAGACGG GGTTCCCGAT CGGCTTCACC 6000
6001 TATACCGGTC ACCCCACGGC GTGCGCCGTC GCGCTCGCCA  ATCTCGACAT CATCGAACGG GAAGGGCTGC TGGAGAACGC 6080
6081 GGTGAAGGTG GGCGACCACC TCGCCGGGCG GCTGGCGGCC  CTGCGCGGGC TGCCCGCCGT GGGGGACGTC CGGCAACTGG 6160
6161 GCATGATGCT CGCCGTCGAG CTGGTGTCGG ACAAGACGGC  CCGCACCCCG CTGCCGGGCG GCACCCTCGG GGTCGTGGAC 6240
6241 GCGCTGCGCG AGGACGCGGG CGTCATCGTC CGGGCCACGC  CGCGCTCCCT GGTCCTCAAT CCGGCGCTCG TGATGGACCG 6320
```

Figure 3e/3

REPLACEMENT SHEET SUBMITTED ON SEPTEMBER 4, 2009

Figure 3 Continued

```
6321 GGCCACGGCG GACGAGGTGG CGGACGGGCT GGACTCGGTG  CTGCGGCGGC TGGCACCCGA CGGGCGGATC GGCGCGGCCC 6400
    stop cvm6par ⟶
6401 CCCGGCGGGG GTGACGAGAC CGCGGGCCGC CACCCGCGGG  GGGCGCCGGG TCGGCACAGC GGCCGACCCG GCGCCTTCCC 6480

6481 CGTTTCCCGG CGCCTTTTCC GTGCCCCGGC GCCGTTCCCG  TGGCCCCTGC CCCTGCCCCT GCTCGGGCGC TCCTCCCTCC 6560

6561 GCTGTGGCGC CGTTCCCGTT CCAGCGCGCT GTCGAGCCGC  CGCCAAGCGC CCCGTGCCAC GGTGGGAGAC CGCCGCCCGA 6640
                                                      ⟶ start orf6par
6641 CGGGGCGCGC GGAGCCCGGC AAGCCGAAGG GAAGTCCCGT  CCGATGCGTG CCTCTTCGCC CAGAGGGTTC CGCGTGCACC 6720

6721 ACGGTCACGC CGGGATCAGG GGGTCCCACG CGGACCTCGC  CGTCATCGCC TCCGACGTTC CCGCGGCGGT CGGCGCGGTG 6800

6801 TTCACCCGTT CGCGGTTCGC CGCGCCGAGT GTGCTGCTCA  GCCGGGACGC GGTCGCCGAC GGGATCGCCC GGGGCGTGGT 6880

6881 GGTGCTGTCC GGCAACGCCA ACGCCGGGAC GGGCCCGCGG  GGGTACGAGG ACGCCGCGGA GGTGCGCCAT CTGGTGGCCG 6960

6961 GGATCGTCGA CTGCGACGAG AGGGATGTGC TGATCGCCTC  CACGGGACCC GTCGGCGAGC GGTATCCGAT GTCCCGTGTC 7040

7041 CGGGCCCATC TGCGGGCGGT GCGCGGGCCC TTACCGGGTG  CCGACTTCGA CGGCGCGGCG GCGGCCGTGC TGGGCACCGC 7120

7121 GGGCGCCCGT CCCACGATCC GGCGGGCGCG GTGCGGCGAC  GCGACGCTGA TCGGTGTCGC CAAGGGCCCG GGTACGGGCC 7200

7201 CGGCGGAGCA GGACGACCGG TCGACGCTGG CGTTCTTCTG  CACGGACGCC CAGGTGAGCC CCGTCGTCCT CGACGACATC 7280

7281 TTCCGCCGGG TCGCGGACCG CGCCTTCCAC GGGCTGGGCT  TCGGCGCCGA CGCCTCCACC GGCGACACGG CGGCCGTTCT 7360

7361 CGCCAACGGG CTCGCGGGCC GGGTGGACCT CGTCGCGTTC  GAACAGGTCC TGGGCGCGCT GGCGCTGGAC CTGGTCAGGG 7440

7441 ACGTCGTCCG GGACAGCGGC TGCGGCGGCG CCCTGGTCAC  GGTGCGGGTC ACCGGGGCCC ACGACACCGA GCAGGCCGGG 7520
```

Figure 3f/3

REPLACEMENT SHEET SUBMITTED ON SEPTEMBER 4, 2009

Figure 3 Continued

```
7521 CGCGTGGGCC GGGCGGTGGT CGACGCGCCG TCGCTGAGGG  CCGCGGTGCA CGGCCCGGCA CCCGACTGGG CGCCGGTCGC 7600

7601 CGCCGTGGCG GGTGGACACG GGGACGAAGG CCCCGGCCGG  TCTCCCGGGC GGATCACGAT CCGGGTCGGC GGCCGGGAGG 7680

7681 TCTTCCCCGC CCCCCGCGAC CGGGCCCGCC CGGACGCCGT  CACCGCGTAT CCGCACGGCG GCGAGGTGAC CGTCCATATC 7760

7761 GACCTCGGTG TCCCGGGCCG GGCGCCCGGC GCGTTCACGG  TCCACGGCTG CGACCTCCTG GCGGGGTACC CGCGCCTCGG 7840
          stop orf6par→
7841 CGCCGGCCGG GCCGTCTGAA CGGGCGCTCC CGGGCGGACG  GCGACCGCGA GGGCGCGGGA GCGCAGGGAA CACGGGAGCG 7920
                                                                  ← stop orf4par
7921 GGCCCGGTGG TCGATCGGCC ACCGGGCCCG CTCCCGTCGT  TCCGTCCGCT GTCCCCGGCC GCCCTACCCC CACCGCTGCC 8000

8001 CGGCGAAGTC CACGGCGCTC TCGGCGTCCA CCGCGTCCAC  CGCGTTCTCG GCGTTCTCGG CGTCGTCCGC CGCCGCCCCC 8080

8081 GGTGGCAGGG GAGAGTCCAC CGGTGCCGAC GCGGGCGACG  TGGTGGCGCG GGCGTACTGG TAGAGCAGTT CGGCCCCGAT 8160

8161 CTCCGCCGCC AGCAGGGAGG TGATCCCCGA CGGGTCGTAC  GCCGGGGACA CCTCGACCAC GTCGAAGCCG ACGGGCCTGA 8240

8241 GCTGCCCGAC CACGTCGAGC AGGGTCAGCA CCTCGCGCGA  GGACAGCCCG CCGGGGGCCG GTGTGCCGGT GCCCGGGGCG 8320

8321 TACGCCGGGT CGACGACGTC GATGTCGACG GAGACGTACA  GCGGCAGGCC GCCGACGGTG CGCCGGATCT GCTCGGCGAT 8400

8401 GCCGCGCGGT GAGCGCCGGG TGAAGTCGGC GGCGGTGACG  ATGCTGACGC CGTGCCCGCG CGCGTAGTCC AGGGAGTCGG 8480

8481 GCCGCGGATT GTGGCCGCGG ATGCCGACCT GGACCAGGCG  CTCCGGGTCC ACCAGGCCCT CTTCGATGGC CCAGCGGAAG 8560

8561 GGGGTGCCGT GGTGGTAGGT GCCGCCGTAG ACGGGTGGGT  TGGTGTCGCT GTGCGCGTCC AGGTGCAGGA CGGCGACCCG 8640
```

Figure 3g/3

REPLACEMENT SHEET SUBMITTED ON SEPTEMBER 4, 2009

Figure 3 Continued

```
8641 GCCGTGGCGG GCGTGCACGG CGCGCAGGGC GGCCAGGGAG  AGCGAGTGGT CCCCGCCCAG CATCAGGAAC GCGTCGTTGC 8720

8721 GTTCCAGGAG CCGGGTCAGG GCGACCGTCG CGGTGTCCAT  CGCCAGGTCC ATCGAGAAGG GGCTGAGGTC GATGTCGCCC 8800

8801 CCGTCGACCA CGTCGATCCG GTCGAAGACC CCTGGGCCCC  GGTCGATGCC GACGCCGTGG ATCAGGCTGG ACTCGTGCCG 8880

8881 GATGGCGCGC GGCGCGAACC GCGCGCCGGG CCGGTAGCTG  GTGCCTCCGT CGTACGGGGC GCCGACGACC ACCACGTCAT 8960
                                                                    start orf4par
8961 GGCCGATCGG GTCGGGCCGG TGGCGCAGCC GCATGAAGGT  CGCCGGTTGG GCGTAGCGCG GGGAGACGGC GGTGGACACC 9040

9041 CTGGCCGTTC CCCGCGCACC CGGCCCTGCT CCCGTTCCCG  TACCGACGCC CGGCCACCCC GTGCGGGCTC CCGTTCCCGT 9120

9121 GCCGACCCCC GTTCCCGAAC GGGCTCCCGT TCCCGCGTGG  AATCCCGTTC CCGCGCCCGC GGCGCCGTCC GGGCCGCGGC 9200

9201 TGCCCCTCCC TCCGAGACCG CTCCTGCCGT TCCTGCGGCC  GTTGCCGCTC TGCGGGCCGG TGCCCGCGCC CACGCCCGCT 9280
                                                                                  stop
9281 GCACCGTCCG CGCCGCCGCC GGTGCCGTTG CCGCCGCCGG  TGCCGTTCTG GCCACCGGTG CCGTTCTGGC CGCTCATACG 9360
     orf3par
9361 ACCACCCGGC CCTGGAGCCT GAGCCTGCGC ACCGCGTCGA  CGGAGCGCCG CACCGTCTCG CCGAAGTCCA CGTCCTCCGG 9440

9441 CGGCACCGTG TCGATGACCA CCGCGTCGTA CAGGCGCCGT  GCCATGGCGC CCTTGACGGC CGTCACCTCG TCGCGCCGGA 9520

9521 TCCCTTCGGC GAGGAGCAGT CCGGTCCACG CGCTGGTGGT  GCCGGACCCC TCGTGGATGC CCAGCTTGGG GCGGGCCACG 9600

9601 GTCTCGGCGG GCAGCAGGCC GGAGAGGGCC TGCCGCAACA  CCCACTTGTC GGTGCCCCGC CGGCGTTTGA GCCCGGGTTC 9680

9681 GAGGGAGACC AGCGCGTCCA GGACCGCGCG GTCCCAGTAC  GGGTGGGTGG TCCACTTCCC GGCGATGCCC GCGAGGACGG 9760
```

Figure 3h/3

REPLACEMENT SHEET SUBMITTED ON SEPTEMBER 4, 2009

Figure 3 Continued

```
 9761 GGGACATCTC GTTGAGGCCG TCGAAGCCCG CCATGTCGCC  CGCGATCTCG TCGTCGAGGG ACCAGAGCGA GGCCGTGCGC 9840
 9841 CGGTGCATAC CGCCGAGCGG GATGTCGGCG CCGTACCCGG  TGAGGATGCG GAGCGGCCCG GTGTCGAGCC GCCGGTAGAG 9920
 9921 GGCGACGAGC GGCAGCAGGT ACTCCAGGAC CGTGGGGTCG  GTGATCTCCG CGGCGGCGAC CGCCCAGGGC AGTTCCCTGA 10000
10001 CGAGTTCGGC CGAGTGGAGC CGGATCTCGC TGTGCGCGGT  GCCCAGGTGG ACGGCGACCG AGCGGGCCGC GTCGAACTCG 10080
10081 TCGGACACCT CGGTGCCCAT CGACACGGAC CGTGTCCCGG  GTGCCAGGGC CGCCGTGTGG GCGGCGACTC CCCCGGAGTC 10160
10161 GATGCCGCCG GACAGGACGA CGGTGGGGGC CGCCTCCCCG  CCGCGCAGCC GGGTGCGGAC CGCCGTGGCG AGGCGTTCGC 10240
10241 CGACCAGGTC CACCGCCTCC CGTTCGCCGG GCAGCGCCCG  GGAGAGCGGG GGTGTCCAGG TGCGGACCGC CCTGGCGGTG 10320
10321 ATGTCGGAGC CGCCGACTCC GTGCAGCAGG AGGGCGGTCC  CGGCGGGGAC CCGGCAGACG CCCGCCGCCC CCGGCGCGGT 10400
10401 GTGGGTGCCG GACAGGCCCA GCGGCCGGCC CGGCTCGTGC  GCCAGGGTCT TCGCCTCGGT GGCGGCGCTC AGCCCCGTCA 10480
10481 CGTCGGCGCG CAGCCACAGC GGTACCGAAC CGGCGTGGTC  GGTGGCCGCG ACGGTCGCGC CGGTGGAGGC GTCGGTGAGC 10560
10561 AGTGCGGCGA ACCGTCCGTT CAGGAGCCGG AAGGCCCCGG  GGCCCCAGCG CCGCCAGGCG GCCAGCAGCA GTTCGGCGTC 10640
10641 GCCGAGGGCG GCAGAGGAGC CGCCGAGCGC TCCGGTCAGC  TCGGCGCGGT TGTACAGCTC GCCCGCCAGG AGCAGCCGGA 10720
10721 CCTGGCCGTC GGCGACCAGG ACGGGCGGAC GGCCCAGGGT  CACGGCCGTT CCGCTCCAGA GCGGGTACGC GGTGCCGTCG 10800
10801 TGCACGGGGA CATGGGTCCC GCGGACGGCG AAGCGGGGTG  CGCTGCCGGG TTCGGAGTGA CCGCCGGGGC CGCCGCCGGG 10880
                                                  start orf3par ←
10881 GCGGCCCTCG GTGCCGATGC GCACCCGGAA TCCGTACACG  AGGTCGGGGC CGGGCATGGT GAACTCGTCC TCCACGGTGG 10960
      ← end orf2par
10961 TCAGATGGCC AGGGCGGCGA AACCGCCGGA CTGGAAGTCG  TAGGCCACCG GTACCTCGAT CAGGAACGGG CGGCCGAGTC 11040
```

Figure 3i/3

REPLACEMENT SHEET SUBMITTED ON SEPTEMBER 4, 2009

Figure 3 Continued

```
11041 CGGCGCCCTT GGTGAGGGCG GCGAGCAGCG AGGTGCGGTC  GGTGGCGCGG ACGGCCTCGC AGCCGTTGGC CTCGGCGAGC 11120
11121 TGGACGAAGT CGACGCTTCC GAAGCCGACG GCGGGGGCGT  GGGAGCGCTG GTGTCCGAGG TTCTGGTACA GCTCGATCAG 11200
11201 GCCGTTGCGG TCGTTGTTGA CGACGACCAT GACGATCGGC  AGGCCCAGGC GCACGGCCGT CTCGATGTCG GCGCTGTTGG 11280
11281 AGTGGAAGCC GCCGTCGCCC GCGATGAGGA AGACGGGCTC  GCCGGGCCGG GCGATCTGGG CGGCCATGGC GGCGGGCAGT 11360
11361 CCGTAGCCGA AGCTGGAGCA GCCCGCGGAG GTGAGGAATC  CGTACGGCTG GTCGGACTTG GCGAAGAGCA CGCCGTAGTG 11440
11441 GCGGAAGAAG CCGATGTCGC TGACGAAGGT GCCGTTGTCG  AGGACGGAGT TCATGCAGTC GATCACCTGG TGGACCCGCA 11520
11521 TGCCGTCCTC GTACTCGGTG GGGTCGGCGA GGAATTCGGC  GACGCGGGCG CGCAGGGCGC TGAGGTCGTG CCGGGTCTTG 11600
11601 GGGGCGAGGC CCGAGGTCGC GTCGTCGAGC GCGGTGACGA  ATTCGGCGAC GTTGGTGACG ATGTCGATGT CGGCGCGGAA 11680
11681 CAGCTCCGGG ATCGGGTTGA CCTCGGGGGC GACCCGGACC  GTGGTCTTGG CCCGGCCCCG CGTCCACATG GAGGGGCGCA 11760
11761 GGTCCTCGGC GTAGTCGTAG CCGATCGCCA GGAGGAGGTC  GGCGGGGCCG AAGATCTCGT CGAGGGCCGG GTGGCCGAGA 11840
11841 ATGCCGTCCA TGTAGCCGCT GATGGCGCCG TAGTTGAGCG  GGTGGTCGTG CGGCAGGACG CCCTTGGCGG TGTAGGTGGT 11920
11921 GACGACGGGG ATGTTCAGCC GCTCGGCGAG GGCGCGCAGG  GCGTCGACGG CCCCGGCGCG GATGACGGCG CTACCGACGA 12000
12001 CGAGGAGGGG GTTCTCGGCC TCGCGCACCA GCTCAGCGGC  CTCGTCGAGG CGGGCGCGCC AGTCGGCGTC CAGGGCGTGG 12080
12081 GTGGCGGTGG CCCGGACCAG GGGGGCGTCG GTGGGGGTGC  CGTTCAGCTC GGCGCCGAGG AGGTCGACCG GCAGGCTGAT 12160
12161 GAAGCTGGGA CCCACGGGCT CGATCCGGCT GTTGAGGACG  GCGCTGTCGA CGAGGTTGAC GATGTCCTCG CCGCGTTCGA 12240
```

Figure 3j/3

REPLACEMENT SHEET SUBMITTED ON SEPTEMBER 4, 2009

Figure 3 Continued

```
 12241 GCTGGACGCT GAACTTGGTC AGCGGGCCCA TCACGGCGGT  GCTGTCCAGG CACTGGTGGG TGACGTTGGG

GTAGCAGTCG 12320

 12321 TACGACTCGG ACTGCGCGGC CAGCGCGATG ACCGAGCTGC  GGTCCAGGGC GGAGGTGGCG ACGCCGGTGG

CCAGGTTGGT 12400

 12401 CATGCCGGGG CCCAGGGTCG CGAAGCACGC CTGGGGGCGG  TTGGTGATCC GGGCGAGGAC GTCCGCCATC

ACCCCGGCGG 12480

 12481 TGAACTCGTG CCGGGTCAGG ACGAAGTCGA GTCCTTCGAC  CTCGTCGAAG AGAATGGCGG ACGCCTCCCG
GCCGACGACG 12560
                                                                  start of orf2par ←
 12561 CCGAATACAT GGTCGACACC GTACTGGTGA AGACGTTCCA  GCATGGCTTT CGCGGTCGTG GTGGCCATGG

AGATCTCCTT 12640

 12641 CGCATCGGAC GGGCGCCGGG ATGGCGCCCC GGAAAACGCG  GCACCGGGCG GTGCGCACCG GGTGGCGCAC

ACCGTGGGTG 12720

 12721 GTGGCGTTGC CACTGTGCGG ATCGCCTCTT GGCGGCGGTC  GGACGCCCGG CTTGGACAGA ATGGGCAAGG

CGCGTTCAAG 12800

 12801 GCATGGCGTC CATCGTCCTC GTGGCGCTTT TCGTGAAATC  CGTCCGGCGC CGACGGTCTC CATCCGATTC
CGTCCCCTTC 12880

 12881 CGTCCACCGA TCCGAGGAGA ATCCATGGAT GTCCTGGCCG  CGTTGGAGCG CAAGCCCAGC CTGAATCTTT

TCCCCATCGA 12960

 12961 GAACCGGCTG TCGCCGCGCG CCAGTGCCGC GCTGGCCACC  GACGCCGTCA ACCGCTATCC GTACTCCGAG

ACCCCGGTGG 13040

 13041 CCGTCTACGG CGATGTCACG GGGCTGGCCG AGGTGTACGC  GTACTGCGAG GACCTGGCCA AGCGCTTCTT

CGGGGCGCGC 13120

 13121 CACGCCGGTG TGCAGTTCCT GTCCGGTCTG CACACCATGC  ACACCGTGCT GACCGCCCTG ACCCCGCCCG

GCGGGCGCGT 13200

 13201 CCTGGTCCTC GCGCCGGAGG ACGGCGGCCA CTACGCCACG  GTGACGATCT GCCGGGGCTT CGGCTACGAG

GTCGAGTTCT 13280

 13281 TACCTTCGAC CGCCGGACAC CTGGAGATCG ACT
13313  (SEQ ID NO:16)
          |   10     |   20     |   30     |   40     |   50     |   60     |   70

|   80
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Figure 3k/3